



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/557,696 | 04/25/2000 | Xiangxin Bi | N19.12-0035 | 8550 |

24113 7590 08/14/2002

PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A.
4800 IDS CENTER
80 SOUTH 8TH STREET
MINNEAPOLIS, MN 55402-2100

EXAMINER

GORDON, BRIAN R

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1743

DATE MAILED: 08/14/2002

15

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/557,696

Applicant(s)

BI ET AL.

Examiner

Brian R. Gordon

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 38-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1 is/are allowed.
- 6) ☒ Claim(s) 1-7, 10, 12-14, 38-44, 53, 54, 56-61, 63-66 and 68 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 11, 45-52, 55, 62 and 67 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 28, 2002 has been entered.

Response to Arguments

1. Applicant's arguments filed May 28, 2002 have been fully considered.
2. Applicant's arguments have been fully considered but they are not persuasive. With respect to the 103 rejection of claim 38 applicant states that the previous rejection (of Paper No. 12) did not specifically explain how the Marsh patent was applied to the claim. The examiner asserts that claim 38 is a broader claim (that is incorporated in claim 1) than that of claim 1 which was specifically addressed, therefore the limitations as claimed in claim 38 were rejected for the same reasons as applied to claim 1.
3. With respect to the 103 rejection of claim 38 applicant argues that Marsh et al. does not provide motivation to employ the use of a plurality of collectors for the collection of the particles and that Marsh lacks discussion of changing feed and other inputs while continuing to operate the disclosed reactor system. The examiner respectfully disagrees with applicant and asserts that Marsh does disclose proper motivation for the use of a plurality of collectors. In column 3 lines 26-42 and by

Art Unit: 1743

examples 1-32 that give different products produced by the method as disclosed by Marsh. The powders may be used as pigments or thickeners, as filters, as binders, etc. In column 5 lines 3-35, Marsh further discloses the desire to produce particles of different sizes by using different reactants to change the pH of the mixture. The examiner asserts that the motivation for use of a plurality of collectors is obviated by the fact the Marsh discloses that one (different customers) may desire products of different properties (pore volume, surface area, particle size, etc.) therefore it would have also been obvious to separate the products as they are produced to one's desired specifications. The collecting of the particles in different containers would allow for the prevention of mixing different products. For reasons given above the 103 rejection of the claims 38, 53-54, and 56-57 is hereby maintained.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 5, 13-14, 45-47, 49-52, 54, 60-61, 64, and 66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what function the nozzle has in the claimed method, as drafted it appears that the nozzle only moves. However the examiner believes the nozzle is for injecting the reactants. It is also unclear if the first and second quantity of reactants are injected from the same nozzle and same inlet.

As to claims 5 and 13-14, claim 1 recites "a nozzle comprising a reactant inlet" as to claim there is only one nozzle and one inlet; however claims 5 and 13-14 suggest that there is more than one nozzle and reactant inlet, which is contradictory of claim 1. The examiner suggests that claim 1 be amended to recite "a least one nozzle comprises at least one reactant inlet" in order to provide a basis for the material claimed in the dependent claims.

As to claims 45-47 and 49-50 it appears as if the claims should read "wherein the step of evaluating the properties comprises".. Ok

As to claims 51-52 it appears as if the claims should read "wherein the step of evaluating the properties is performed".. Ok

As to claim 54, it is unclear if the reactants are within the same or different fluid streams.

As to claim 60, the examiner asserts that the claim essentially claims the same subject matter as claim 58. There is no distinct difference in reciting the reactants are materially different and that the reactants comprise different compounds. Ok

As to claims 61 and 66, it is unclear what function the nozzle has in the claimed method, as drafted it appears that the nozzle only moves. However the examiner believes the nozzle is for injecting the reactants.

As to claim 64, it is unclear what is the function of the reaction chamber. It is not clear that the reactants are reacted within the chamber. The claim also recites "wherein the reaction chamber remains isolated from the ambient environment continuously from the reacting of the first quantity of reactants and through the reacting of the second Ok

Art Unit: 1743

quantity of reactants;". It is unclear what is meant by this phrase, however, the examiner, believes applicants intent is to claim wherein the reaction chamber remains isolated from the ambient environment during the step of reacting of the first quantity of reactants and through the step of reacting of the second quantity of reactants

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See *OK* MPEP § 2172.01. The omitted steps are: injecting a first quantity of fluid reactants into fluid stream through said reactant inlet of said nozzle; injecting a second quantity of fluid reactants into fluid stream through said reactant inlet of said nozzle

7. Claim 52 recites the limitation "after removing products from the collectors". There is insufficient antecedent basis for this limitation in the claim. The step of removing the products from the collectors is not mentioned in any preceding claims *OK* which it depends. Therefore it is unclear if the removing step is being claimed.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 1743

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 38, 53-54, 56-60, 63-65, and 68 are rejected under 35 U.S.C. 103(a) as being obvious over Marsh et al. US 4,649,037.

Marsh et al. discloses a method in which inorganic metal oxides having high surface area and pore volume are prepared by spray drying. The process of producing metal oxide powders which comprises: (a) admixing reactants comprising an organic solvent, at least one hydrolyzable metal compound, and a sufficient amount of water to at least partially hydrolyze said hydrolyzable metal compound; (b) supplying the admixture as a plurality of droplets to a heating zone (radiating heat source) operated under conditions of temperature and pressure below the critical temperature and pressure of the reactants but sufficient to produce a product comprising metal oxide powders, and a gas comprising organic solvent vapors; (c) separating said product from

Art Unit: 1743

said gas; and, (d) collecting the product. Different reactants may be added to the stream admixture (solution or gel) in order to produce a product of different properties.

FIG. 1 schematically illustrates an indirect heated, closed cycle spray drying apparatus (operated by Bowen Engineering Inc., Somerville, N.J.) of the type preferably employed in producing our novel metal oxide powders. As illustrated, the gel (one form of the admixture) is supplied to a supply line 1. Compressed gas is applied via a line 2 to aid in feeding the admixture to the spray dryer. Optionally, cooling water is fed via a line 3 to cool the supply line 5 used to deliver the admixture to spray drying chamber 9, thus preventing premature vaporization of the admixture in the nozzle. Nitrogen (or some other "non-oxygen containing" gas; i.e., a gas having a maximum O.sub.2 content less than or equal to about 0.1%, and preferably less than the lower explosion limit for the solvent) is supplied via a line 4 to the spray drying chamber 9 to function as the drying medium. In operation, the nitrogen is initially cycled through the system and thereafter continuously recycled with make-up nitrogen being supplied through the nozzle 4 as needed. The nitrogen is heated to the appropriate drying temperature in a preheater 7 (e.g., a steam heater) and is supplied (cocurrently) to the spray drying chamber 9 through a line 7 and circumferential supply opening 8. The gel is fed through the line 1 (via the compressed gas supplied through line 2) to the supply line 5 which feeds the gel through a nozzle 10. Within the spray drying chamber 9 is a rotating wheel or disk 11 which functions to atomize the gel. In spray drying chamber 9, a product comprising metal oxide powders, and vapors comprising water and organic solvent are produced from the gel. The product and vapors are pumped through outlet

12 and supply line 13 to a separator 14 (e.g., a cyclone separator) wherein the product is separated from the vapor. The product is removed from the separator via outlet 15. The vapor, containing reaction product fines is drawn off through take-off vent 16 and supplied by a line 17 through a nozzle 18 to a baghouse 19. In the baghouse 19, the product fines are collected and removed via outlet 20.

Marsh et al. does not specifically recite that the device comprises a plurality of collectors; however, it would have been obvious to one of the ordinary skill in the art to recognize that in varying the reactants of the system different collectors or containers would be necessary to collect the different products from outlet 20 of the system in order to avoid mixing the products or cross contamination.

11. Claims 1-7, 10, 12-14, 39-44, 61, 66 rejected under 35 U.S.C. 103(a) as being unpatentable over Marsh et al. as applied to claims 38, 53-54, and 56-57 above, and further in view of Acosta et al. US 6,254,826.

Marsh et al. does not disclose that the device used to perform the method comprises one or more movable nozzles that may comprise a plurality of reaction inlets.

Acosta teaches a multiple conduit (inlets and nozzles) substance transfer device, and substance transfer device positioning structure.

A flexible tube 428, preferably formed of a plastic material, or other suitable conduit structure, extends from the central conduit 422 of the manifold 420. Tube 428 may be connected to a containers (not shown) in which fluids can be stored.

A flexible tube 448, preferably formed of a plastic material, or other suitable conduit structure, extends from the central conduit 442 of the dispenser manifold 440

and may be connected to a container (not shown) which stores substances to be dispensed into receptacles. Substances are preferably supplied from a remote storage container to the substance transfer device 400 via tube 448 by a hand pump (not shown) calibrated to withdraw a predetermined amount of substance from the storage container for dispensing the predetermined amount into the receptacles through the dispenser manifold 440.

It would have been obvious to one of ordinary skill in the art to modify the device of Marsh by incorporating the transfer device of Acosta in order to supply the multiple reactants or substances to the drying chamber (reaction chamber) of Marsh et al. in order to avoid the cross-contamination that may occur when using a common supply device for different reactants.

Allowable Subject Matter

7. Claims 8-9, 11, 45-52, 55, 62, 67 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Marsh et al. does not disclose a method for obtaining a plurality of quantities to compositions wherein the method comprises a radiation path defined by a radiation source (infrared laser) and directing optical elements wherein the reacting of the fluid reactants involves interacting radiation source with the reactants. The apparatus comprises pumps and valves that allow for the first collector to be exposed to the forces

Art Unit: 1743

of the pump while the first particles are collected and the second collector is exposed to the forces of the pump while the second particles are collected.

Conclusion


12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schultz, Ushikubo, and Nakano disclose liquid transfer devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is (703) 305-0399. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 703-308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7719 for regular communications and (703) 305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

brg
August 12, 2002


Jill Warden
Supervisory Patent Examiner
Technology Center 1700